

PATENT SPECIFICATION

409,028

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PROVISIONAL SPECIFICATION.

Improvements in Valve Boxes for Pumps.



I, EDWARD ALEXANDER STANLEY SWINSON, of 73, Upper Newtownards Road, Belfast, in Northern Ireland, British Subject, do hereby declare the nature of this invention to be as follows:—

The invention has for its purpose the improvement of the construction of pumps, particularly pumps used for pumping corrosive and gritty liquids at high pressures for agricultural spraying purposes, with the object of removing the difficulties encountered by having to remove the valves for clearing away at frequent intervals, the grit held in suspension and precipitated during in-action with consequent leakage. For this purpose I arrange the valve and valve seats of both suction and delivery valves, in such a manner that they may be interchanged, removed or replaced quickly, without interfering with the working or setting of the pump.

For the purpose of this specification, such an arrangement as applied to a pump for pumping copper sulphate and

lime solution at high pressures for fruit spraying purposes, is indicated in the accompanying drawing, which shows a part sectional elevation. The suction and delivery valves are identical and of the same construction. In a casing (*vc*) of cast iron or other metal a lantern shaped valve seat (*vs*) of stainless steel or other non-corrodible metal is pressed (or the whole may be a cored casting), having an annular chamber in the casing to allow the fluid to pass. The lift of the valve—which may be a stainless steel ball or the like—is determined by a bridge piece (*bp*) across the orifice. The whole is arranged with the centre line of the valve, valve seat and bridge piece co-inciding with the centre line of the fluid stream. Removal is accomplished by sliding out the whole unit from between the securing flanges (*f*). Fluid tightness is secured by means of rings (*pr*) of leather, rubber or the like, inserted in grooves formed concentrically in the ends of the casings (*vc*).

Dated this 25th day of October, 1932.

EDWD. A. S. SWINSON.

COMPLETE SPECIFICATION.

Improvements in Valve Boxes for Pumps.

I, EDWARD ALEXANDER STANLEY SWINSON, A.M.I.Mech.E., of 73, Upper Newtownards Road, Belfast, in Northern Ireland, British Subject, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The invention relates to pumps and particularly to pumps used for pumping corrosive and gritty fluids at high pressures for agricultural and other spraying purposes. The invention has for its object the construction of the valves of such pumps in such a manner that leakage of the valves due to the grit held in suspension and precipitated during inaction will be avoided, that the action of the valve will be silent, and that removal of

the valve box for cleaning purposes and replacement may be rapidly accomplished.

The invention comprises essentially a floating valve box consisting of a hollow metal cylinder into which is pressed or screwed a lantern of bronze or other non-corrodible metal open at one end and bridged at the other, in such a manner that a ball of stainless steel, or other suitable material, may have a restricted movement therein.

The open end of the lantern abuts against a hard non-corrodible steel ring secured between the lantern and an annular shoulder on the inside of the cylinder, which ring forms the seat of the valve. The metal cylinder has recesses in both ends concentric with centre line of the lantern and ball into which are

pressed soft rubber rings of suitable section arranged to project beyond the face of the cylinder.

In order that a clear idea of the invention may be obtained, a valve box so constructed is shown in the accompanying drawing which is a sectional elevation of such a valve box shown in place between the pump chamber of a spray pump and the suction pipe. (It is obvious that in interchanging the positions of the pipe and pump chamber the arrangement becomes a delivery valve without change of construction).

pb is a pump body of which *pc* is the pump chamber. The suction pipe *sp* is held to the pump body by means of long steel studs *ss*. The faces of the suction pipe flange *f^a* and the pump flange *f* are machined flat and smooth. The hollow cylinder *hc* has a screwed in bronze lantern *l* which secures the stainless steel ring *sr* tight against the shoulder in the hollow cylinder *hc*. The stainless steel ball valve *sb* is restricted in its lift by the bridge *b* in the lantern and seats itself on the inner edge of the ring *sr*. Square section rings of rubber *rr* are held in dove tailed recesses in both ends of the cylinder *hc*, and project beyond it.

The rubber rings *rr* not only secure fluid tightness under high pressure but act as cushioning devices permitting in actual practice a movement of the box between the flanges *f^a* and *f* corresponding to the pulsating pressure action. Slackening the nuts (which may be quick acting devices) on the studs *ss* permits the complete box to be removed, from between the flanges *f^a* and *f*.

The line contact between the hard steel ball *sb* and the steel ring *sr* prevents the abrasion and consequent leakage prevalent with flat faced or mitre valves.

It is obvious that the pressure in the valve box being perfectly balanced there is no tendency of the box to shift from its position and no retaining rings or fittings are required.

I am aware of patent No. 4115/88 claiming an easily removeable plug consisting of a tapering block containing a ball valve which can be closed by means of an external screwed spindle and nothing which has already been covered in this patent is claimed by me.

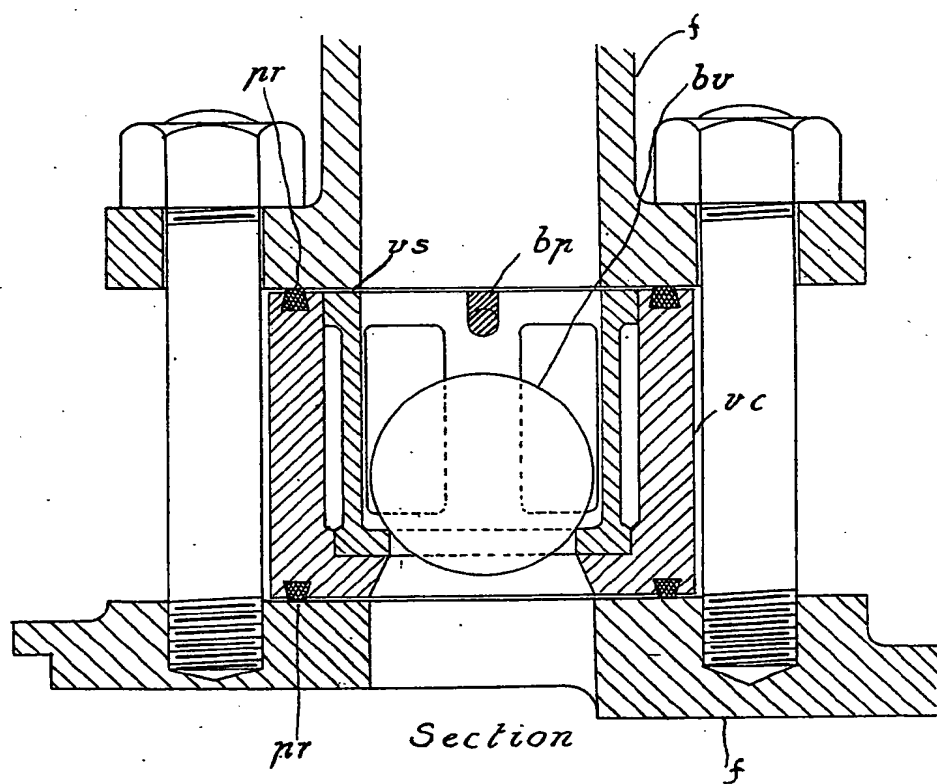
Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

(1) In agricultural spray pumps a hollow cylindrical floating valve box having an internal lantern of bronze securing a non-corrodible seat and restricting the movement of a non-corrodible ball substantially as hereinbefore described and illustrated in the accompanying drawings.

(2) In agricultural spray pumps the construction of floating valve boxes according to claim 1 with concentric cushioning devices between which the valve body can have a limited movement in the manner and for the purpose as hereinbefore described and illustrated in the accompanying drawings.

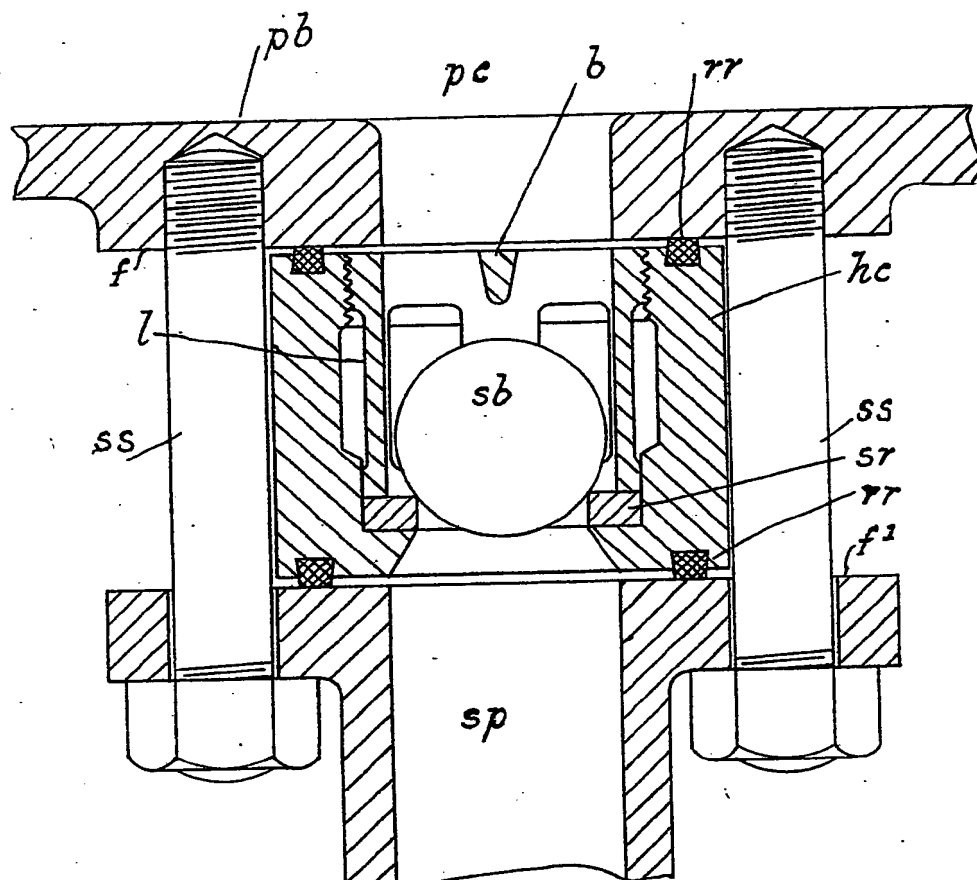
Dated this 20th day of October, 1933.
EDWD. A. S. SWINSON.

[This Drawing is a reproduction of the Original on a reduced scale.]



Malby & Sons, Photo-Litho.

[This Drawing is a reproduction of the Original on a reduced scale.]



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